GUIDELINES FOR ESTIMATING STRAND LOSS IN PRECAST PRESTRESSED CONCRETE (PPC) DECK BEAM BRIDGES

(February 2004)

Prestressed strands incorporated in PPC Deck Beams shall be disregarded during analysis for load-carrying capacity based on the following observed conditions:

LONGITUDINAL CRACKS

1) Cracks observed in the middle area of the beam underside, with or without rust stains or other discoloration of the concrete adjacent to the cracks:
   Disregard all strands from all rows of strands that may be located adjacent to the cracks.
2) Cracks observed along the edges of the beam underside, with or without rust stains or other discoloration of the concrete adjacent to the cracks:
   Disregard at least the strands located adjacent to the edge of the beam in the bottom row of strands. When the crack is extensive in length and its location varies in distance from the beam edge, disregard additional interior strands from all rows of strands that may be intersected by the crack.
3) Two longitudinal cracks observed crossing or meeting:
   Disregard all strands in all rows of strands located between the cracks and one strand from all rows of strands located adjacent to the outer edge of the cracks.

   Note: The intent is to disregard all strands that could intersect the crack and be exposed to air and moisture.

DETERIORATION

1) Exposed strands observed with sound concrete adjacent to and above the exposed strands:
   Disregard exposed strands only.
2) Exposed strands observed with unsound concrete adjacent to and above the exposed strands:
   Disregard exposed strands and all strands located in rows above and immediately adjacent to the area of unsound concrete.
3) Exposed reinforcement bars observed (#3 or #4 stirrups typically extending less than 1-foot in from the sides of the beam):
   Disregard the strands located in the lower row directly above the exposed stirrups. If the concrete is found to be unsound adjacent to the exposed reinforcement bars, disregard all strands in all rows located above the area of unsound concrete.
4) Exposed wire mesh or full width reinforcement stirrup bars observed on bottom of beam:
   Judge whether or not the wire mesh or reinforcement bars are in contact with the strands.
   - If in contact, disregard all strands in the lower row directly above the exposed wire mesh or stirrups.

- If not in contact but the concrete adjacent to the exposed wire mesh or stirrups is found to be unsound, disregard all strands located above the area of unsound concrete.
- If not in contact and concrete adjacent to the exposed wire mesh or stirrups is sound, do not disregard strands during analysis.

5) Areas of delaminated concrete observed:
   Remove all delaminated concrete to determine the depth of concrete deterioration.
   - If reinforcement stirrup bars, wire mesh or strands are exposed, treat as in "1" through "4" above.
   - If no reinforcement, mesh or strands are exposed but there are indications that the exposed concrete is unsound within the affected area, disregard all strands located in the rows of strands above the area.
   - If no reinforcement, mesh or strands are exposed in the affected area and concrete in the area is found to be sound, do not disregard strands in analysis.
6) Wet or stained areas observed on bottom or side of beams:
   Closely inspect the wet or stained area to determine the soundness of the concrete.
   - If close inspection indicates that concrete is unsound or delaminated, treat as in "5" above.
   - If close inspection confirms that the concrete is sound, do not disregard strands in analysis.

   Note: Wet and/or rust stained areas should be watch closely. These areas will be the next areas to experience significant deterioration.